

**Amendments to the Claims:**

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1-19. (Canceled)

20. (Previously Amended) A silicon single crystal produced according to Czochralski method to which Ga (gallium) is added as a dopant wherein a resistivity is  $5 \Omega \cdot \text{cm}$  to  $0.1 \Omega \cdot \text{cm}$  wherein a diameter of the single crystal is 4 inches or more, and the single crystal is used for a solar cell.

21. (Previously Amended) A silicon single crystal produced according to Czochralski method to which Ga is added as a dopant wherein concentration of Ga in the crystal is  $5 \times 10^{17} \text{ atoms/cm}^3$  to  $3 \times 10^{15} \text{ atoms/cm}^3$  wherein a diameter of the single crystal is 4 inches or more, and the silicon single crystal is used for a solar cell.

22. (Previously Added) The silicon single crystal to which Ga is added according to Claim 20 wherein concentration of interstitial oxygen in the single crystal is  $20 \times 10^{17} \text{ atoms/cm}^3$  (ASTM'79) or less.

23. (Canceled)

24. (Previously Added) A silicon single crystal wafer produced according to the Czochralski method to which Ga is added that is produced by slicing the silicon single crystal according to Claim 20.

25-26. (Canceled)

27. (Previously Added) A silicon single crystal solar cell produced using the silicon single crystal to which Ga is added according to Claim 20.

28. (Previously Added) A silicon single crystal solar cell produced using the silicon single crystal wafer to which Ga is added according to Claim 24.

29. (Previously Added) The silicon single crystal solar cell according to Claim 27 wherein the area of the solar cell is  $100 \text{ cm}^2$  or more.

30. (Previously Added) The silicon single crystal solar cell according to Claim 27 wherein a conversion efficiency of 20% or more.

31. (Previously Added) The silicon single crystal solar cell according to Claim 29 wherein a conversion efficiency of 20% or more.

32. (Previously Added) The silicon single crystal solar cell according to Claim 27 wherein the silicon single crystal solar cell is for space use.

33. (Previously Amended) The silicon single crystal solar cell according to Claim 27, wherein loss of overall conversion efficiency due to photo-degradation is 0.5 % or less.

34. (Previously Amended) The silicon single crystal solar cell according to Claim 29, wherein loss of overall conversion efficiency due to photo-degradation is 0.5 % or less.

35. (Currently Amended) The silicon single crystal solar cell according to Claim 30, wherein loss of overall conversion efficiency due to photo-degradation is 0.5 % or less.

36. (Currently Amended) The silicon single crystal solar cell according to Claim 32, wherein loss of overall conversion efficiency due to photo-degradation is 0.5 % or less.

37. (Currently Amended) A method for production of silicon single crystal ~~wafer~~ to which Ga is added according to Czochralski method wherein Ga is added in a silicon melt in a crucible, a seed crystal is brought into contact with the silicon melt and is pulled with rotating to grow a silicon single crystal ingot having a diameter of 4 inches or more used for a solar cell.

38. (Currently Amended) The method for production of silicon single crystal ~~wafer~~ to which Ga is added according to Claim 37 wherein addition of Ga to a melt in a crucible is conducted by growing a silicon crystal ingot in which Ga of high concentration is added previously, and ~~crashing~~ crushing the silicon single crystal doped with Ga in high concentration to prepare a doping agent, and adding Ga in the silicon melt ~~to using~~ using it.

39. (Currently Amended) The method for production of silicon single crystal wafer to which Ga is added according to Claim 37 wherein the number of rotation of a crucible while the single crystal ingot is grown is 30 rpm or less.

40. (Currently Amended) The method for production of silicon single crystal wafer to which Ga is added according to Claim 37 wherein a pressure in a furnace of a pulling apparatus while the silicon single crystal is grown is in the range of 10 to 500 mbar.

41. (Currently Amended) The method for production of silicon single crystal wafer to which Ga is added according to Claim 37 wherein an amount of inert gas to be flown in a furnace of a pulling apparatus while the single crystal is grown is in the range of 10 to 500 l/min.

42. (Currently Amended) The method for production of silicon single crystal wafer to which Ga is added according to Claim 37 wherein the inert gas flown in the furnace of the pulling apparatus while the single crystal is grown is argon.

43. (Currently Amended) The silicon ~~singe~~single crystal to which Ga is added according to claim 20 wherein the resistivity of the single crystal is  $5\ \Omega\cdot\text{cm}$  to  $0.2\ \Omega\cdot\text{cm}$ .

44. (Currently Amended) The silicon ~~singe~~single crystal to which Ga is added according to claim 21 wherein the resistivity of the single crystal is  $5\ \Omega\cdot\text{cm}$  to  $0.2\ \Omega\cdot\text{cm}$ .

45. (Currently Amended) The method for production of silicon single crystal wafer to which Ga is added according to claim 37 wherein the resistivity of the silicon single wafer is  $5\ \Omega\cdot\text{cm}$  to  $0.2\ \Omega\cdot\text{cm}$ .

46. (New) A method for producing a solar cell comprising:  
making a solar cell from a wafer wherein the wafer has been produced by  
manufacturing a silicon single crystal according to Czochralski method, wherein

Ga (gallium) is added as a dopant,

boron is not added as a dopant,

the silicon single crystal has a resistivity in the range of from  $5\ \Omega\cdot\text{cm}$  to  $0.1$

$\Omega\cdot\text{cm}$ , and

the diameter of the single crystal is 4 inches or more; and  
processing the silicon single crystal to obtain the silicon single crystal wafer.

47. (New) A method for producing a solar cell comprising:

making a solar cell from a wafer wherein the wafer has been produced by  
manufacturing a silicon single crystal according to Czochralski method, wherein

Ga (gallium) is added as a dopant,

boron is not added as a dopant,

the concentration of Ga in the silicon single crystal is in the range from

$5 \times 10^{17}$  atoms/cm<sup>3</sup> to  $3 \times 10^{15}$  atoms/cm<sup>3</sup>, and

the diameter of the single crystal is 4 inches or more; and

processing the silicon single crystal to obtain the silicon single crystal wafer.

48. (New) A solar cell comprising a wafer having a diameter of 4 inches or more,

manufactured from a silicon single crystal produced according to Czochralski method,  
wherein

Ga (gallium) is added as a dopant,

boron is not added as a dopant, and

the silicon single crystal has a resistivity in the range of from  $5 \Omega\cdot\text{cm}$  to

$0.1 \Omega\cdot\text{cm}$ .

49. (New) A solar cell comprising a wafer having a diameter of 4 inches or more,

manufactured from a silicon single crystal according to Czochralski method, wherein

Ga (gallium) is added as a dopant,

boron is not added as a dopant, and

the concentration of Ga in the silicon single crystal is in the range from

$5 \times 10^{17}$  atoms/cm<sup>3</sup> to  $3 \times 10^{15}$  atoms/cm<sup>3</sup>.